services it justly claims. Why, then, should choice fall, as it has fallen, upon a comparatively junior Fellow who, whatever his scientific merit, is unknown as a leader in science? Is there no room at present for another planet in the official firmament? Whatever be the cause, a large number of Fellows view with dismay this departure from the wise tradition which required pre-eminence amongst the eminent in science as the passport to the position of officer in the Royal Society, and to many the nomination, if it be confirmed, will appear a damaging blow to the society's prestige.

It may be that notwithstanding the protest referred to those responsible for the nomination do not realise its full significance and the feeling it has stirred. If this be as strong as it appears there is provided by the constitution of the society at the general meeting on the 30th an opportunity for its expression.

I am, &c., F.R.S.

It may be remarked that on looking back into the history of the Society, we find the last four Treasurers to have been—

General Sabine	1850
Prof. W. A. Miller	1861
Dr. Spottiswoode	1870
Sir John Evans	1878

NOTES.

THE Royal Society's medals have this year been adjudicated as follows:—Copley Medal, Sir William Huggins, F.R.S.; Royal Medals, Rev. John Kerr, F.R.S., Mr. Walter Gardiner, F.R.S.; Rumford Medal, Prof. Oliver Lodge, F.R.S.; Davy Medal, Prof. Johannes Wislicenus, For. Mem. R.S.; Darwin Medal, Prof. Karl Pearson, F.R.S.

AT the anniversary meeting of the Royal Society on November 30, the following names will be recommended for election into the Council of the Society for the year 1899:—President: Lord Lister. Treasurer: Alfred Bray Kempe. Secretaries: Prof. Michael Foster, Prof. Arthur William Rücker. Foreign Secretary: Sir Edward Frankland, K.C.B. Other members of the Council: Prof. Thomas George Bonney, Captain Ettrick William Creak, R.N., Prof. Daniel John Cunningham, Prof. James Dewar, Prof. William Dobinson Halliburton, Prof. William Abbott Herdman, Victor A. H. Horsley, Joseph Larmor, Prof. Nevil Story Maskelyne, Sir Andrew Noble, K.C.B., Prof. Edward Bagnall Poulton, Dr. William James Russell, Prof. Arthur Schuster, Dr. Dukinfield Henry Scott, Dr. George Johnstone Stoney, Prof. Joseph John Thomson.

PROF. OSTWALD will give an address at University College, Gower Street, on Monday next, November 14, at 5 p.m., in the Chemical Theatre. Visitors are invited.

THE appointment of a Commission, consisting mainly of scientific experts, to report upon the plague in India, has already been referred to in these columns (vol. lviii. p. 626). We now learn that Dr. Thomas R. Fraser, F.R.S., Professor of Materia Medica and Clinical Medicine at Edinburgh University, has accepted the duty of president, and with him will be associated two other scientific experts, Dr. Wright, Professor of Pathology at the Army Medical School, Netley, and Dr. Rüffer, who has been for some time head of the Egyptian Sanitary Department at Cairo. Two officers of the Indian Civil Service, Mr. J. P. Hewett, and Mr. A. Cumine, both of whom have had much to do with recent plague affairs in India, have also been appointed to the Commission by the Government of India. The scope of the Commissioners' inquiries will include (1) the origin of the different outbreaks of plague; (2) the manner in which the disease is communicated; (3) the effects of certain prophylactic and curvative serums that have been tried or recommended for the disease. The members of the Commission will reach Bombay towards the end of the present month.

MR. CECIL B. CRAMPTON, of the University of Edinburgh, has been appointed to the position of assistant-keeper in the geological department of the Manchester Museum, Owens College, in succession to Mr. Herbert Bolton.

AT the anniversary meeting of the Mineralogical Society, to be held on Tuesday next, November 15, the election of officers and Council will take place. Prof. A. H. Church, F.R.S., has been nominated president, and Prof. G. D. Liveing, F.R.S., and Dr. Hugo Müller, F.R.S., vice-presidents.

WITH reference to Dr. Calmette's gift of 10,000*l.* to the Pasteur Institute at Lille, mentioned last week, the *British Medical Journal* states that, according to the terms of the deed of gift, the money is to be applied provisionally to the defraying of building expenses till the Municipal Council is in a position to vote the sums required for that purpose. The money is then to be employed in the purchase of material for new researches, or for the maintenance of young men of science who wish to make original researches in the laboratory. Dr. Calmette states that the money which he has thus generously bestowed, represents the profits accruing to him from the application of one of his discoveries in a large distillery at Seclin.

THE new session of the Royal Geographical Society will commence on Monday next, November 14, when addresses upon the subject of a British Antarctic expedition will be given by the President and others. At a meeting on November 28, Mr. C. W. Andrews will give an account of a year's work on Christmas Island. Other papers which are announced are the following:—"Exploration in the Caroline Islands," by F. W. Christian; "Lake Rukwa and Central Africa," by L. A. Wallace; "In Search of Mount Hooker and Mount Brown in the Canadian Rockies," by Dr. Norman Collie, F.R.S.; "Oceans and Continents," by Dr. J. W. Gregory; "Atlantic Highlands of the United States," by Prof. W. M. Davis; "Exploration in Sokotra," by Dr. H. O. Forbes.

DR. H. C. SORBY, F.R.S., who last year completed fifty years' connection with the Sheffield Literary and Philosophical Society, during which period he on several occasions filled the presidential chair, has just received a gratifying testimony of the esteem in which he is held locally as well as in the broad world of science. His admirers have had his portrait painted, and presented it to him with an illuminated address on Tuesday in last week. The portrait represents Dr. Sorby seated, and in his scarlet academic gown. The inscription at the foot of the frame is as follows:—"H. Clifton Sorby, LL.D., F.R.S. (1847–1897). This portrait was painted to celebrate Dr. Sorby's fifty years' connection with the Sheffield Literary and Philosophical Society, and to commemorate his world-wide scientific reputation. Funds for the purpose were provided by subscription amongst the proprietors and members of the Society. The artist was Mrs. M. L. Waller, and the presentation was made on behalf of the subscribers by the Lord Mayor of Sheffield on November 1, 1898."

THE first meeting of the new session of the Society of Arts will be held on Wednesday next, November 16, when an address will be delivered by Sir John Wolfe Barry, K.C.B., F.R.S., Chairman of the Council. Among the subjects of papers to be read before Christmas are: "Long Distance Transmission of Electric Power," by Prof. George Forbes, F.R.S.; "Photographic Developers and Development," by Mr. C. H. Bothamley. The papers for meetings after Christmas include: "Tuberculosis in Animals," by Mr. W. Hunting; "Canals and Inland Navigation in the United Kingdom," by Mr. L. F. Vernon-Harcourt; "Preservation of Timber," by Mr. S. B. Boulton; "Electric Traction and its Application to

Railway Work," by Mr. Philip Dawson; "Coal Supplies," by Mr. T. Forster Brown; "Wireless Telegraphy," by Mr. W. H. Preece, C.B., F.R.S.; "Leadless Glazes," by Mr. Wilton P. Rix. The following courses of Cantor lectures will be delivered: "Acetylene," by Prof. Vivian B. Lewes; "Bacterial Purification of Sewage," by Dr. Samuel Rideal; "Cycle Construction and Design," by Mr. Archibald Sharp; "Leather Manufacture," by Prof. Henry R. Procter.

WRITING in the *Chemical News* "On the supposed new gas, Etherion," described by Mr. Charles F. Brush at the recent Boston meeting of the American Association, Sir William Crookes concludes as follows:—"On the evidence at present available, I consider it more probable that etherion is water vapour than that it is a new elementary gas, and this is corroborated by the observations made by Mr. Brush, that etherion is absorbed by phosphoric acid and soda-lime, as well as by the powdered glass from which it has previously been driven off by heat."

MR. JOHN S. BUDGETT, who accompanied Mr. Graham Kerr in his recent successful expedition to Paraguay, has left England, under instructions of the Zoological Society, for a winter visit to the Gambia, in order to obtain information concerning the Antelopes and other larger mammals of that Colony. Mr. Budgett will also make a collection of the fishes of the River Gambia, concerning which little is at present known, and of the other zoological products of the district.

THE expedition of Mr. Harrington and Dr. Hunt, of Columbia University, New York, to Egypt, referred to last week, resulted in bringing back an admirable collection of Nile fishes, and other zoological materials, but was not successful in its chief object, which was to obtain a set of the embryonic stages of *Polypterus*. Although these naturalists remained in the Delta until August 30, and adult specimens of this fish were obtained as late as that date, the eggs were still immature; so that the important question of the nature of development of *Polypterus* still awaits investigation.

MR. STANLEY S. FLOWER, lately curator of the Royal Museum, Bangkok, has been appointed director of the Zoological Gardens at Gizeh, Cairo, and has arrived there from Siam to take up his appointment. Mr. Flower, on his voyage westward, brought with him, as a present to the Zoological Society of London, a young Siamang (*Hylobates syndactylus*), which is believed to be the first specimen of this rare ape that has ever reached Europe alive. In 1830 the late Dr. George Bennett started from Singapore, with a living Siamang, which he intended to bring to the Society, but it unfortunately died on its way home.

A NEW Natural History Museum was opened at King Williams Town, Cape Colony, on October 5. At the conversazione, subsequently held, an address was given by Mr. W. L. Sclater, director of the South African Museum, Capetown. Mr. Sclater, after speaking of museums in general and their origin, gave an account of their introduction into South Africa in 1856 by the foundation, under the governorship of the late Sir George Grey, of the South African Museum at Capetown. Not long afterwards the Albany Museum at Grahamstown was instituted with the object of illustrating the natural products of the eastern provinces of the Colony. There are also museums in South Africa at Port Elizabeth, Bloemfontein, Pretoria, Maritzburg and Durban.

MANY students of science will regret to see the announcement that *Science Progress* comes to an end with the number just published. The valuable character of the contributions which have appeared in that magazine since the first number was published in March 1894, are well known in the scientific world; and it is a little disappointing to the publishers to have to confess that there is not sufficient demand for such literature to justify them in continuing to issue it. It is to be regretted that a periodical of this kind, containing articles which assist the advance of scientific knowledge, should have to cease for want of financial support.

CAPTAIN J. W. MAXWELL CARROLL has sent to the *Geographical Journal* (November) a few interesting particulars with reference to ancient stone circles discovered by him in the neighbourhood of Lamin Koto, on the right bank of the Upper Gambia. The stones are in very good preservation, and are regarded with respect by the natives. Prayers are offered in their vicinity on feast days during Ramadan by the Almame, or high priest. The diameter of the circle of stones is eighteen feet, and the stone at which the priest stands is a few feet to the east of the circle. Stone circles were also found by Captain Carroll at Chamen and Palellan. At the latter place a large rectangular stone, twelve feet by four, was discovered. Its height was six feet at one end and four at the other, and its shape suggested that it had been used as a sacrificial altar.

IN the *Zeitschrift der Gesellschaft für Erdkunde* we notice, besides minor articles, an account by Dr. C. Lauterbach of the geographical results of the expedition to Kaiser Wilhelm's Land, and a paper, by Dr. Meinardus, on the relation between the winter climates of central and north-western Europe and the waters of the North Atlantic. The latter is an extension of the author's recent paper in the *Meteorologische Zeitschrift*, discussing the observations of Pettersson and Dickson as a possible basis for long-period weather forecasting.

IN our issue of September 29 last, we very briefly referred to Dr. Köppen's chart of yearly isotherms and isabnormals of the sea surface. This chart, together with a discussion of its chief features, is reproduced in *Globus* of the 15th ult. The chart shows, in addition to the isotherms, those districts where a temperature anomaly of more than 2° C. exists; the areas where the water is too cold are shaded blue, and those which are too warm are shaded red, while the districts which are thermically neutral are left unshaded. It is seen that between latitude 0° and 40° S., cold currents extend like long tongues from the west coast of South Africa and South America towards the west, while to the north of the equator analogous currents are developed to a much less extent; on the coast of the Sahara the sea-temperature is only slightly below the normal value of the latitude. On the western sides of the oceans, in similar latitudes, there exist warm currents trending northwards. In the South Atlantic the warm and cold currents are nearly equalised. In the South Pacific, the cold current, and in the South Indian Ocean, the warm current, preponderates. This latter feature especially occurs in the northern hemisphere, and more particularly so in the North Atlantic. It is also seen that an area of cold water occurs on the western edge of the warm currents, and between them and the continents, where the latter stretch northwards as far as the zone of westerly winds, viz. on the east coasts of Asia, North and South America. There are many other points of interest, to which we are unable to allude at present.

THE Deutsche Seewarte has recently published its twentieth annual report, for the year 1897. The death of Captain Seemann, on September 24 of that year, has been a great loss to the department, as he had for a long time devoted himself to the study and practice of weather telegraphy. A conference of the heads of German meteorological institutions was held at the Seewarte in October 1897, at which special attention was given to the organisation of the meteorological service; a report of the proceedings has been published. During the year, 283 merchant ships were supplied with registers, and 794 logs were received; the majority of the observations were made in the North Atlantic, but the other oceans are also fairly represented. The observations for the North Atlantic are chiefly utilised in the preparation and publication of results for one-degree squares and of daily synoptic weather charts, both of which works we have already noticed. The Seewarte undertakes the verification of a large number of instruments; it also publishes the results of scientific investigations in the work entitled *Aus dem Archiv der Deutschen Seewarte.* This valuable publication has also already been referred to in our columns. The collection of observations from distant stations is a useful addition to the various other labours of the institution, but the publication of the results has been temporarily retarded by pressure of other work.

Problems on the deformation of an elastic ellipsoid are known to require for their complete solution functions in working with which a fairly good mathematician may easily go out of his depth. MM. Eugène and François Cosserat, however, send us a note, reprinted from the *Comptes rendus*, in which they show that the particular solutions corresponding to harmonics of the second and third orders, assume comparatively simple forms.

A highly interesting note by Prof. B. Grassi, on the connection between mosquitoes and malaria, appears in the *Atti dei Lincei*, vii. 7. The theory that these insects disseminate the germs of malaria by their punctures, seems to have been first brought into notice by Laveran; but Dr. Grassi for a long time had doubts on the subject, owing to the absence of malaria from certain districts where mosquitoes abound; Schwetzingen, in Germany, being a notable instance. A careful classification of the various species of gnat found in different districts has now led him to the conclusion that, while certain kinds are not confined to malarious regions, the distribution of others coincides very closely with the distribution of the disease. The common *Culex pipiens* is to be regarded as perfectly innocuous; being most abundant in places from which malaria is absent. On the other hand, a large species (*Anopheles claviger*, Fabr.), known in Italy as "zanzarone," or "moschino," is constantly found associated with malaria, and is most abundant where the disease is most prevalent. In illustration of this fact Dr. Grassi enumerates a number of striking coincidences in which both gnats and the disease are confined to the same limited and well-defined regions. Another disseminator of malaria is *Culex penicillaris*, and the author gives authentic instances in which recorded punctures of this gnat have been followed by febrile symptoms. Certain other species of *Anopheles* are confined to the marshy regions where malaria rages, and two or three additional species of *Culex* are suspected, but on less conclusive evidence. The fact is mentioned that *Anopheles claviger* confines its attacks chiefly to the evening after sunset, and in this circumstance the old superstition that it is dangerous to fall asleep in malarious regions just after sunset, finds a ready explanation. These facts open up new hopes that it may be possible to stamp out malaria by taking proper steps for the destruction of mosquito larvae in districts where dangerous species abound.

The annual report for 1896-97 on British New Guinea (*c*-9046-5) contains only a few notes of interest to science. The reports of visits of inspection are not so full as in previous years, and there are the ominous footnotes "not printed" relating to several documents of interest. The natives of the lower villages of the Mambare River are very untrustworthy. It was during the visit to this district that the inspectors "for the first time learned how the natives make the hole for the reception of the wooden handle in stone clubs. It is chipped out by means of a small stone about the size and nearly of the shape of a rifle bullet." On the crossing of the Chirima they were visited by about one hundred natives from the village of Neneba. They are the only tribe that actually live on a spur of Mount Scratchley. They are somewhat darker in tint than the coast people, but distinctly lighter than the average Fly River man. They are of fair size and wiry in build. No wavy-haired native was seen in that part of the country, and young men wear the eyebrows, while the elders have whiskers. The features are good and not irregular. The men wear the T-bandage, and the women, in addition to this, wear a petticoat and a mantle. The chief ornaments are earrings made of lizards' tails, and cigarette-holders carried in the lobe of the ear. They had the bow and arrow, and stone clubs, but, like many other bow and arrow tribes, they have no pottery. The floors of their houses are six or eight feet above the ground. At the village of Gosisi, on the Vanapa, the natives did not appear to know of any place or people on the other side of the Owen Stanley range. The men of these tribes have remarkable physical proportions and strength.

An interesting pamphlet upon the temperance question, from the pen of Dr. Archdall Reid, has just reached us. It is entitled "The Temperance Question from a Biological Standpoint." The author bases his theories and conclusions upon Weissmanism, viz. upon the assumption that inborn or congenital characters alone are transmitted to the offspring, acquired characters not being transmitted. Man is still undergoing evolution at the present day, and this, according to the author, mostly consists in the acquisition by him of immunity against disease or the effect of powerful drugs, including harmful narcotics. Alcohol is a harmful narcotic; from this it follows that one of the directions which the evolution of man is taking at the present day is the acquisition of immunity against alcohol, and this takes the special form of a diminution of the "normal" craving for alcohol. According to Dr. Reid the longer a race has had alcohol, and the easier and more abundant its supply, the more sober it is. For instance, the grape-growing southern Europeans are at the present time more sober than the races of northern Europe, where alcohol is more difficult to obtain, although formerly they were quite as drunken. They have become now immune to alcohol. The method by which this immunity has come about is naturally, from the point of view of the temperance reformer, of the utmost importance. Since, if it could only be imitated successfully, the temperance question would be solved. According to Dr. Reid this diminution of the craving for alcohol has been produced by the action of natural selection working in the presence of an abundant supply of the harmful substance in question. Any cause which reduces the supply of alcohol, or in any way increases the difficulty of obtaining it, in that it hampers the action of natural selection, tends to perpetuate drunkenness rather than to produce temperance. This truly dreadful picture of the world, or rather all races not yet immune, becoming "thoroughly drunken before they can hope to become thoroughly sober," can, to some extent, be mitigated by artificial selection. The innate drunkard, when found out by letting everybody have free access to alcohol, must be treated as a lunatic, and above all not be allowed to procreate. By this means the alcohol tainted "germ plasm" will finally be eliminated, and the race will become immune to alcohol.

The older entomologists used to complain that the *Lepidoptera* were a peculiarly difficult order to classify, owing to the want of any salient characters; but now that the details of their structure are more minutely studied, the difficulty is rather to decide on the importance to be attached to the structure of particular organs. Even the eggs are now taken into account in classification, and also the larvae in their various stages, for the earlier stages often possess characters of importance, throwing much light on the real affinities of the insects, which characters disappear in the half-grown or full-grown larva. The organs of the perfect insects are also receiving much attention from various entomologists who interest themselves in morphology; and two years ago Dr. Enzio Reuter, of Helsingfors, published an elaborate account of the structure of the palpi in butterflies; while in the last part of *Novitates Zoologicae*, the organ of the Tring Museum, Dr. K. Jordan has published a long and interesting article on the antennae of butterflies, dealing especially with the structure of the scales, sense-hairs, setiferous punctures and sense-bristles in the various families of butterflies, and, incidentally, in some moths. As is generally the case in such inquiries, "we learn that an antennal organ or structure is variable in one family, while it is relatively constant in other groups." We have not space to notice Dr. Jordan's remarks on the bearings of his inquiries on the phylogeny and classification of butterflies, for which we must refer our readers to the paper itself.

IN the same part of the *Novitates Zoologicae*, Dr. Jordan replies to some severe criticisms made by the late Prof. Eimer on the views put forward by the Hon. Walter Rothschild and Dr. Jordan on the classification of the *Papilionidae.* We cannot enter into the controversy; but may say that Dr. Jordan holds that Prof. Eimer was himself in error, owing to want of sufficient materials on which to base trustworthy conclusions.

MESSRS. OLIVER AND BOYD, Edinburgh, will, early in 1899, publish a book containing a biographical sketch of the late Mr. James Shaw, Tynron, and selections from his prolific writings on scientific, antiquarian, rural and literary subjects. Two hundred and fifty copies have already been subscribed for, and the material is now being prepared for press by Prof. Robert Wallace, University, Edinburgh, to whom all communications on the subject should be addressed.

A CONSIDERABLE space in the *Journal of Horticulture* for October is occupied by several papers on perfumes, by Mr. F. W. Burbidge. He gives a long list of perfumes and essential oils, and of the plants from which they are obtained, and a copious bibliography of the subject. A description and drawing is also given of the late Mr. A. Smee's apparatus contrived for condensing the perfume from fresh flowers; and reference is made to the antiseptic properties of perfumes, and to their remarkable power, as described by Prof. Tyndall, of absorbing heat from the atmosphere. The burning of perfumes or incense in churches, hospitals, &c., had undoubtedly originally a hygienic purpose. The Rev. G. Henslow gives a paper on the advantages to gardeners of a knowledge of vegetable physiology; and Mr. F. Enock one of his entertaining papers, very well illustrated, on insect blights and blessings. Mr. F. M. Bailey adds three new species of *Nepenthes* to the flora of Queensland, the pitchers of which are figured.

A VOLUME containing reports of experiments on the manuring of oats, hay, turnips, and potatoes, conducted in 1897 on farms in the south-west and centre of Scotland, under the direction of the agricultural department of the Glasgow and West of Scotland Technical College, has just been published.

THE following announcement is made in the *British Journal of Photography*:—"M. Berthiot, the well-known optician of Paris, has constructed a new 'satz' or casket of wide-angle lenses. It contains four single lenses; composed of three elements that have 24, 24, 31 and 39 cm. foci respectively, and can be used as single lenses, or combined they give 12, 16, 16 and 17·5 cm. foci lenses. On the authority of Dr. C. Fabre, the author of the well known *Traité Enclyclopédique de Photographie*, the doubtlets will include an angle of more than 100° without spherical aberration."

THE fourth volume of "Bibliotheca Geographica," edited by the Berlin Gesellschaft für Erdkunde, and prepared by Dr. Otto Baschin, has just appeared. It is a classified catalogue of geographical works published during 1895, the works being arranged alphabetically according to authors. The classification adopted is as follows:—A. General geography: (1) bibliography; (2) methods and instruction; (3) general publications; (4) historical geography; (5) mathematical and astronomical geography, cartography; (6) physical geography; (7) biological geography; (8) anthropo-geography; (9) hints for travellers and observers. B. Special geography: (1) voyages and travels in several continents; (2) Europe; (3) Asia; (4) Africa; (5) Australia and New Zealand; (6) Oceania; (7) America; (8) polar regions; (9) oceans and seas. The publisher of the bibliography is W. H. Kuhl, Berlin.

A USEFUL series of graduated arithmetical examples, worked in full by approved methods, makes up a little volume entitled "How to Work Arithmetic," by Mr. Leonard Norman, published at the Rugby Press. The models appear to have been carefully chosen, and should be of assistance in cultivating neatness of style and uniformity of method in large schools.—The use of sketches in teaching the first rules of arithmetic is shown in the "Picturesque Series" of arithmetical problems published by the National Publishing and Supply Association, Ltd., Reading, for Standards I. to III. of elementary schools. The same publishers issue a "Deductive Series of Arithmetical Problems," by Mr. T. Bowen, based on questions asked by inspectors of elementary schools, and with solutions of leading questions worked in full. We have also received from the National Publishing and Supply Association the second edition of "Quantitative Exercises for Beginners in Chemistry," Parts I. and II., by Mr. A. H. Mitchell. The books are adapted to the requirements of students under the Department of Science and Art in quantitative and qualitative analysis.—The third edition of a "Key to Algebraical Factors, and their application to various Processes in Algebra," by Mr. Dorabji H. Vachha, has been published by Messrs. Longmans, Green, and Co.

A SERIES of experiments on the connection between taste and chemical composition has been carried out by Dr. Kahlenberg, and described by him in the *Bulletin* of the University of Wisconsin. Thirteen persons between twenty and thirty years of age—three being women—a lady of sixty, and a gentleman of sixty-three, served as subjects. The subjects were abstainers from alcohol and tobacco, and were kept in ignorance of the composition of the liquids tasted. The results show that for a substance to affect the taste, it must be soluble in water readily diffusible and capable of reacting chemically with the protoplasm of the terminals of the nerves of taste. The taste of solutions is said to correspond to the modern theory of electrolytic dissociation. Thus a sour taste is attributed to hydrogen ions, which may be detected in a 1/800 normal solution, whilst alkaline taste is due to hydroxyl ions. Chlorine ions have a salty taste, and so in a less degree have bromine and iodine ions. The variation of intensity of taste with atomic weight, here indicated, is said to be observed with positive ions.

THE current number of the *Berichte* contains an account of the re-determination of the density of ozone by Prof. Ladenburg. The ozone was prepared as pure as possible by cooling ozonised oxygen in a tube surrounded by liquid air. Of the 22 cc. of liquid thus obtained, nine-tenths were allowed to evaporate in order to remove the liquid oxygen. In this way 2 to 3 cc. of a blue-black opaque liquid were obtained, and with the gas produced by its evaporation two experiments were made, one to determine the density, the other to determine the percentage of ozone. The density was determined by measuring the velocity of effusion, water being used instead of mercury as the trapping liquid. The amount of ozone in the gas was determined by means of potassium iodide and sodium thiosulphate. The results gave for ozone a density of 1·456 as compared with 1 for oxygen; the theoretical number being, of course, 1·5. The agreement, considering the difficulty of the experiments, is quite satisfactory. In the course of the observations Prof. Ladenburg found that water at ordinary temperatures and pressures does not dissolve more than one-hundredth of its volume of ozone. In attempting to determine the boiling point of liquid ozone it appeared that this point lay at −125° C., but as soon as the boiling commenced the liquid exploded with great violence and reduced the whole apparatus to powder.

THE additions to the Zoological Society's Gardens during the past week include a Serval (*Felis serval*) from Africa, a Black-footed Penguin (*Spheniscus demersus*) from South Africa, presented by Mr. H. S. H. Cavendish; two Black-backed Jackals (*Canis mesomelas*) from South Africa, presented by Lady De Trafford; a South Albemarle Tortoise (*Testudo vicina*) from South Albemarle Island, Galapagos Group, presented by Captain E. S. Tindall; a Ring-tailed Lemur (*Lemur catta*) from Madagascar, a Garnett's Galago (*Galago garnetti*) from East Africa, a —— Kangaroo (*Dorcopsis*, sp. inc.) from New Guinea, an Orange-winged Amazon (*Chrysotis amazonica*) from South America, deposited; two Spur-winged Geese (*Plectropterus gambensis*), two —— Fruit Pigeons (*Phalacrotreron abyssinica*) from West Africa, two Bar-tailed Godwits (*Limosa lapponica*), European, purchased; a Bennett's Wallaby (*Macropus bennetti*), two Squirrel-like Phalangers (*Petaurus sciureus*), born in the Gardens; six Glossy Ibises (*Plegadis falcinellus*), bred in the Gardens.

OUR ASTRONOMICAL COLUMN.

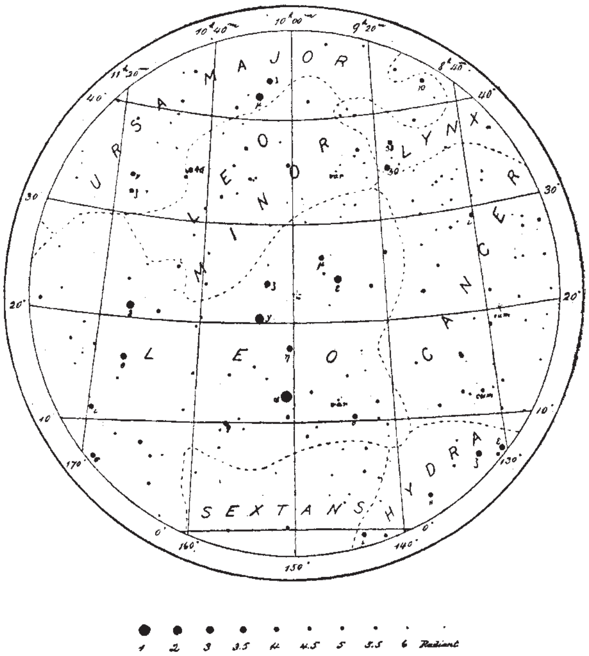
THE LEONIDS.—During the present week, if we are favoured with fine weather, the Leonid swarm or swarms of meteorites should be very conspicuous, assuming they have not decreased very considerably in number since the year 1865. That a great number of observers will be on the watch for them, there is little doubt, and photography will most probably be extensively used for obtaining records in addition to the naked eye It may be well here to sum up some of the important features which must be noted when observing these moving strangers, and we cannot do better than enumerate those given by Mr. Denning in his interesting article (*Observatory*, 1897) on this great meteor swarm. Thus, the observer should record the exact time of maximum abundance, the number of meteors per minute, the position of the centre of radiation, the area of this radiant if diffuse, and the duration of the shower's chief activity. Further, their relative magnitudes, duration of their visible flights, colours, and the apparent paths of the brighter meteors should be noted. Many other peculiarities which the observer may remark, such as shape of nuclei and apparent diameters of bolides (if there be any), description of curved paths, broken streaks, and duration of streaks with direction of their drift, should be accurately recorded. A convenient form of table for entering such data could be made with the following headlines:—Date, Greenwich Mean Time, Magnitude, Observed path (from R.A., Dec. to R.A., Dec.), Length of trail, and Notes.

It will be of interest to inquire whether the shower is divided into three parts, as Mr. Marsh has suggested. The following is the predicted times for these groups when they will be centrally passed by the earth:—

	Preceding.		Central.		Following.	
		h.		h.		h.
1897 ...	Nov. 13	9·25	Nov. 14	0	Nov. 14	15
1898 ...	,,	15·75	,,	6·5	,,	21·5
1899 ..	,,	22·25	,,	13	,,	4

As there will be practically no moon to interfere with the observations this year, every opportunity ought to be taken to obtain a good record. Next year at the same period the moon will be nearly full and visible the whole night, and this will undoubtedly interfere with observations, in spite of the fact that the number of meteors reaches its maximum.

The accompanying chart, which is a reproduction of that published by Prof. W. H. Pickering in his account of the last year's observations at Harvard, shows the position of the radiant point in Leo and the neighbouring constellations.



Further information concerning the probable appearance of this swarm of meteors will be found in the interesting article contributed by our well-known authority on this subject, Mr. Denning, in the present issue.

COMET BROOKS.—This comet is rapidly decreasing its declination and becoming fainter. The following ephemeris is based on the elements of Ristenpart and Muller.

1898.	R.A. (app.)			Decl. (app.)		Br.
	h.	m	s.	°	′	
Nov. 11	17	53	1	+ 7	39·6	0·6
13	17	57	14	4	50·4	
15	18	0	56	+ 2	16·3	0·5

The comet is still in the constellation of Ophiuchus, and on the 15th will lie in the prolongation of a line joining κ and β Ophiuchi at a distance from β of about one-third of that between these stars.

STARS WITH GREAT VELOCITIES IN THE LINE OF SIGHT.—Prof. W. W. Campbell, who is making spectrographic determinations of stellar motions, has found evidences of large velocities in several of the stars he has examined. η Cephei is one of the stars he mentions (*Astrophysical Journal*, vol. viii. No. 3), and the mean velocity deduced on five different occasions from a discussion of 136 lines in the spectra amounts to − 86·8 kilometres per second; this when corrected for solar motion reduces to − 74·1 kilometres per second. The results of Belopolsky for the brighter component of ζ Herculis (*Astr. Nachr.*, vol. 133, p 257–262) have also been corroborated, the corrected velocity amounting to − 53·9 kilometres per second. It may be remembered that Prof. Keeler found for the planetary nebula G.C. 4373 as a result from six nights of measurement, a velocity of − 64·7 kilometres per second.

η Pegasi seems to have a very variable velocity, the extreme range observed amounting to 23 kilometres per second. The velocities that Prof. Campbell has obtained up to the present time are:—

		km.			km.
1896 Aug.	27	+ 7·1	1898 Aug.	29	+ 16·5
Sept.	23	+ 5·1	Aug.	30	+ 15·6
1897 July	8	− 6·4	Sept.	4	+ 16·5
Sept.	28	− 2·2			

We are evidently here dealing with a period somewhere about two years in length. Prof. Campbell hopes that if other observers have secured measurements of this star, they will communicate their results to assist him in determining the period.